X1

# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/823,728 | 03/30/2001 | Kosuke Nishio | 28569.9700 | 5974 |

7590 06/10/2004

Michael K. Kelly
Snell & Wilmer, LLP
One Arizona Center
400 East Van Buren Street
Phoenix, AZ 85004-2202

| EXAMINER | |
|---|---|
| VO, HUYEN X | |
| **ART UNIT** | **PAPER NUMBER** |
| 2655 | 6 |

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. 09/823,728 | Applicant(s) NISHIO ET AL. | |
|---|---|---|---|
| | Examiner Huyen Vo | Art Unit 2655 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4-5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 6, 17, 26, and 32-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsutsui (US Patent No. 6199038).

3. Regarding claim 1, Tsutsui discloses an encoder comprising:

an input device for sampling an input signal at predetermined time intervals to obtain sampled data on a temporal axis (*col. 5, ln. 39-45, the input at terminal 100 are sample points of the signal*);

a conversion device for converting the sampled data on the temporal axis to spectral data on a frequency axis (*col. 5, ln. 43-47*);

a quantization device for quantizing the spectral data on the frequency axis (*figure 3 or referring to col. 6, ln. 15-34*); and

an output device for outputting a resultant value of quantization as an encoded bit stream (*col. 6, ln. 27-34*),

wherein the quantization device comprises:

an expected-value-of-quantization adjustment portion for determining an expected value of quantization for a specific sub-band on the frequency axis (*col. 12, ln. 20 to col. 14, ln. 11, that is to adjust the value of the quantization precision*), and

a quantization portion for determining a quantization coefficient for the specific sub-band, and quantizing each of a plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 44*), and

the quantization coefficient for the specific sub-band is determined so that a resultant value of quantization obtained by quantizing one spectral data selected from the plurality of spectral data contained in the specific sub-band, using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 35 , taking the fact that all the spectral component within each subband is normalized to one value*), is substantially equal to the expected value of quantization for the specific sub-band (*col. 13, ln. 56 to col. 14, ln. 10, adjusting the value of quantization precision by adding or subtracting one until it is equal to the original value B(i)*).

4. Regarding claim 2, Tsutsui further discloses:

a first quantization portion for obtaining a resultant value of quantization by quantizing the selected one spectral data (*col. 7, ln. 12-67, taking the fact that all the spectral component within each subband is normalized to one value*);

a quantization coefficient determination portion for determining the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 35*); and

a second quantization portion for quantizing each of the plurality of spectral data contained in the specific sub-band, using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 35*),

the quantization coefficient determination portion modifies an initial value of the quantization coefficient by a predetermined amount to obtain at least one quantization coefficient (*col. 13, ln. 56 to col. 14, ln. 11*), and compares at least one resultant value of quantization obtained by the first quantization portion using the at least one quantization coefficient with the expected value of quantization for the specific sub-band, and determines a quantization coefficient so that a resultant value of quantization is substantially equal to the expected value of quantization (*col. 13, ln. 23 to col. 14, ln. 38 or referring to figures 15-16, the value of the quantization precesion is updated so to minimize quantization errors*), and

the expected-value-of-quantization adjustment portion adjusts the expected value of quantization for the specific sub-band depending on a number of bits which can be allocated for the encoded bit stream (*col. 12, ln. 20-67*).

5. Regarding claim 3, Tsutsui further discloses that when for a plurality of quantization coefficients, the resultant value of quantization is equal to the expected value of quantization, the quantization coefficient determination portion selects one of the plurality of quantization coefficients so as to obtain a minimum of quantization noise, and determines the selected quantization coefficient as a quantization coefficient for the specific sub-band (*col. 14, ln. 39 to col. 15, ln. 10*).

6. Regarding claim 6, Tsutsui further discloses that the selected one spectral data is the largest spectral data contained in the specific sub-band (*col. 8, ln. 45-67, describes a process of normalizing sub-band spectral components to the largest spectral value*).

7. Regarding claim 17, Tsutsui discloses an encoder comprising:

an input device for sampling an input signal at predetermined time intervals to obtain sampled data on a temporal axis (*col. 5, ln. 39-45, the input at terminal 100 are sample points of the signal*);

a conversion device for converting the sampled data on a temporal axis to spectral data on a frequency axis (*col. 5, ln. 43-47*);

a quantization device for quantizing the spectral data on the frequency axis (*figure 3 or referring to col. 6, ln. 15-34*); and

an output device for outputting a resultant value of quantization as an encoded bit stream (*col. 6, ln. 27-34*),

wherein the quantization device comprises:

a quantization coefficient adjustment portion for determining a quantization coefficient for a specific sub-band on the frequency axis (*col. 9, ln. 53 to col. 10, ln. 44*); and

a quantization portion for determining a resultant value of quantization for each of the plurality of spectral data contained in the specific sub-band, based on a predetermined relationship between a quantization coefficient, a resultant value of quantization, and an inverse quantization value (*col. 9, ln. 53 to col. 10, ln. 35 , taking the fact that all the*

*spectral component within each subband is normalized to one value*), is substantially equal to the expected value of quantization for the specific sub-band (*col. 13, ln. 56 to col. 14, ln. 10, adjusting the value of quantization precision by adding or subtracting one until it is equal to the original value B(i)*).

8. Regarding claim 26, Tsutsui discloses an encoder comprising:

an input device for sampling an input signal at predetermined time intervals to obtain sampled data on a temporal axis (*col. 5, ln. 39-45, the input at terminal 100 are sample points of the signal*);

a conversion device for converting the sampled data on the temporal axis to spectral data on a frequency axis (*col. 5, ln. 43-47*);

a quantization device for quantizing the spectral data on the frequency axis (*figure 3 or referring to col. 6, ln. 15-34*); and

an output device for outputting a resultant value of quantization as an encoded bit stream (*col. 6, ln. 27-34*),

wherein the quantization device comprises:

an expected-value-of-quantizat- ion adjustment portion for determining an expected value of quantization for a specific sub-band on the frequency axis (*col. 12, ln. 20 to col. 14, ln. 11, that is to adjust the value of the quantization precision*); and

a first quantization portion for determining an initial value of a quantization coefficient for the specific sub-band, based on a predetermined relationship among a

quantization coefficient, a resultant value of quantization, and an inverse quantization value (*col. 9, ln. 53 to col. 10, ln. 44*);

a quantization coefficient adjustment portion for determining the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 44*); and

a second quantization portion for quantizing each of the plurality of spectral data contained in the sepcific sub-band using the quantization coefficient for the specific sub-band (*col. 12, ln. 40-67*), and

the first quantization portion determines the initial value of the quantization coefficient so that a resultant value of quantization obtained by quantizing one spectral data selected from the plurality of spectral data contained in the specific sub-band, using the initial value for the specific sub-band, is substantially equal to the expected value of quantization for the specific sub-band (*col. 9, ln. 44 to col. 10, ln. 44*), and

the quantization coefficient adjustment portion adjusts the quantization coefficient for the specific sub-band so that quantization noise is not greater than qantization noise which is obtained when each of the plurality of spectral data contained in the specific sub-band is quantized using the initial value (*col. 10, ln. 45 to col. 11, ln. 59*).

9. Regarding claims 32-33, Tsutsui discloses a program for causing a computer to executing an encoding process for outputting an input signal as an encoded bit stream, and computer-readable recording medium for storing an encoding process program for outputting an input signal as an encoded bit stream (*a person of ordinary skill in the art would implement the method*

*taught by Tsutsui in software program for executing by computing devices*), the encoding process comprising the steps of:

(a) sampling an input signal at predetermined time intervals to obtain sampled data on a temporal axis (*col. 5, ln. 39-45, the input at terminal 100 are sample points of the signal*);

(b) converting the sampled data on the temporal axis to spectral data on a frequency axis (*col. 5, ln. 43-47*);

(c) quantizing the spectral data on the frequency axis (*figure 3 or referring to col. 6, ln. 15-34*); and

(d) outputting a resultant value of quantization as an encoded bit stream (*col. 6, ln. 27-34*),

wherein the step (c) comprises:

(c-1) determining an expected value of quantization for a specific sub-band on the frequency axis (*col. 12, ln. 20 to col. 14, ln. 11, that is to adjust the value of the quantization precision*); and

(c-2) determining a quantization coefficient for the specific sub-band, and quantizing each of a plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 44*) and

the step (c-2) comprises the step of determining the quantization coefficient for the specific sub-band so that a resultant value of quantization obtained by quantizing one spectral data selected from the plurality of spectral data contained in the specific sub-band, using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 35 , taking the fact that all the spectral component within each subband is normalized*

*to one value*), is substantially equal to the expected value of quantization for the specific sub-band (*col. 13, ln. 56 to col. 14, ln. 10, adjusting the value of quantization precision by adding or subtracting one until it is equal to the original value B(i)*).

10. Regarding claim 34, Tsutsui discloses a communication device comprising:

a demodulator for obtaining digital audio data by demodulating an input signal (*col. 35-45*);

an encoder for obtaining an encoded bit stream by encoding the digital audio data (*col. 5, ln. 43-55*); and

a recorder for recording the encoded bit stream into a recording medium (*col. 5, ln. 43-44*),

wherein the encoder comprises:

an input device for sampling the digital audio data at predetermined time intervals (*col. 5, ln. 39-45, the input at terminal 100 are sample points of the signal*);

a conversion device for converting the sampled data on the temporal axis to spectral data on the frequency axis (*col. 5, ln. 43-47*);

a quantization device for quantizing the spectral data on the frequency axis (*figure 3 or referring to col. 6, ln. 15-34*); and

an output device for outputting a resultant value of quantization as the encoded bit stream (*col. 6, ln. 27-34*),

wherein the quantization device comprises:

an expected-value-of-quantization adjustment portion for determining an expected value of quantization for a specific sub-band on the frequency axis (*col. 12, ln. 20 to col. 14, ln. 11, that is to adjust the value of the quantization precision*); and

a quantization portion for determining a quantization coefficient for the specific sub-band, and quantizing each of a plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 44*), and

the quantization coefficient for the specific sub-band is determined so that a resultant value of quantization obtained by quantizing one spectral data selected from the plurality of spectral data contained in the specific sub-band, using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 35 , taking the fact that all the spectral component within each subband is normalized to one value*), is substantially equal to the expected value of quantization for the specific sub-band (*col. 13, ln. 56 to col. 14, ln. 10, adjusting the value of quantization precision by adding or subtracting one until it is equal to the original value B(i)*).

## *Claim Rejections - 35 USC § 103*

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 4-5, 7-16, 18-25, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui (US Patent No. 6199038) in view of Ishikawa (US Patent No. 5115241).

13. Regarding claims 4-5, Tsutsui fails to specifically disclose that the quantization noise is calculated based on a difference between the selected one spectral data contained in the specific sub-band and an inverse quantization value obtained by inversely quantizing the resultant value of quantization as well as by inversely quantizing a result of quantization of each spectral data in the specific sub-band.

However, Ishikawa teaches that the quantization noise is calculated based on a difference between the selected one spectral data contained in the specific sub-band and an inverse quantization value obtained by inversely quantizing the resultant value of quantization as well as by inversely quantizing a result of quantization of each spectral data in the specific sub-band (*col. 3, ln: 10-67 or referring to figures 3-4, the operation is in a continuous process. Therefore, every sub-band is processed one by one*). The advantage of using the teaching of Ishikawa in Tsutsui is to enable the system to adjust its quantization levels based on the obtained quantization error to reduce errors in the reconstructed signal.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tsutsui by incorporating the teaching of Ishikawa in order to enable the

system to adjust its quantization levels based on the obtained quantization error to reduce errors in the reconstructed signal.

14. Regarding claim 7, Tsutsui further discloses that the quantization portion determines the quantization coefficient for the specific sub-band based on a predetermined relationship among a quantization coefficient, a resultant value of quantization, and an inverse quantization value, and based on the relationship, quantizes each of the plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band (*col. 9, ln. 53 to col. 10, ln. 44*), and a process of adjusting the quatization coefficients to minimize the quantization error (*col. 9, ln. 53 to col. 10, ln. 44, this process continues until minimum quantization error is achieved*).

Tsutsui fails to specifically disclose that the quantization portion determines the quantization coefficient for the specific sub-band based on an inverse quantization value, and the quantization coefficient for the specific sub-band is determined so that an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the quantization coefficient for the specific sub-band is substantially equal to the selected one spectral data.

However, Ishikawa teaches that the quantization portion determines the quantization coefficient for the specific sub-band based on an inverse quantization value, and the quantization coefficient for the specific sub-band is determined so that an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the quantization coefficient for the specific sub-band is substantially equal to the selected one

spectral data (*figures 3-4 or col. 3, ln. 10-67, quantization error is calculated by subtracting the original signal with the inverse-quantized signal*). The advantage of using the teaching of Ishikawa in Tsutsui is to enable the system to adjust its quantization levels based on the obtained quantization error to reduce errors in the reconstructed signal.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tsutsui by incorporating the teaching of Ishikawa in order to enable the system to adjust its quantization levels based on the obtained quantization error to reduce errors in the reconstructed signal.

15. Regarding claim 27, Tsutsui further disclose that the second quantization portion quantizes each of the plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band, based on a predetermined relationship among a quantization coefficient, a resultant value of quantization (*col. 9, ln. 53 to col. 10, ln. 44*), and a process of adjusting the quatization coefficients to minimize the quantization error (*col. 9, ln. 53 to col. 10, ln. 44, this process continues until minimum quantization error is achieved*).

Tsutsui fails to specifically disclose that second quantization portion quantizes each of the plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band, based on and an inverse quantization value. However, Ishikawa teaches that second quantization portion quantizes each of the plurality of spectral data contained in the specific sub-band using the quantization coefficient for the specific sub-band, based on and an inverse quantization value (*figures 3-4 or col. 3, ln. 10-67, quantization error is*

*calculated by subtracting the original signal with the inverse-quantized signal*). The advantage of using the teaching of Ishikawa in Tsutsui is to enable the system to adjust its quantization levels based on the obtained quantization error to reduce errors in the reconstructed signal.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tsutsui by incorporating the teaching of Ishikawa in order to enable the system to adjust its quantization levels based on the obtained quantization error to reduce errors in the reconstructed signal.

16. Regarding claims 8, 18, and 28, Tsutsui does not disclose that the predetermined relationship is defined in a first inverse quantization value table defining a relationship between a quantization coefficient and an inverse quantization value when a resultant value of quantization is predetermined, and a second inverse quantization value table defining a relationship between a resultant value of quantization and an inverse quantization value when a quantization coefficient is predetermined.

However, Ishikawa further teaches that the predetermined relationship is defined in a first inverse quantization value table defining a relationship between a quantization coefficient and an inverse quantization value when a resultant value of quantization is predetermined, and a second inverse quantization value table defining a relationship between a resultant value of quantization and an inverse quantization value when a quantization coefficient is predetermined (*col. 5, ln. 27-63 and TABLES 1-2*). The advantage of using the teaching of Ishikawa in Tsutsui is to

provide a method for controlling the operation of the quantizer and dequantizer in order to achieve high efficiency.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tsutsui by incorporating the teaching of Ishikawa in order to provide a method for controlling the operation of the quantizer and dequantizer in order to achieve high efficiency.

17. Regarding claims 9-11, 19-21, and 29, Tsutsui does not disclose that the quantization portion generates, based on the first and second inverse quantization value tables, a relationship between a quantization coefficient and an inverse quantization value when a resultant value of quantization is different from the predetermined resultant value of quantization, or a relationship between a resultant value of quantization and an inverse quantization value when a quantization coefficient is different from the predetermined quantization coefficient, and an inverse quantization value on the first and second inverse quantization value tables are represented by inverse of the inverse quantization values.

However, Ishikawa further teach that the quantization portion generates, based on the first and second inverse quantization value tables, a relationship between a quantization coefficient and an inverse quantization value when a resultant value of quantization is different from the predetermined resultant value of quantization, or a relationship between a resultant value of quantization and an inverse quantization value when a quantization coefficient is different from the predetermined quantization coefficient (*Tables 1-2 and col. 5, ln. 13-46, the*

*comparison circuit in figure 4 outputs "0" or "1" to specify to the quantizer and dequantizer which table to use. This describes the relationship between quantizer and dequantizer and control values*), and an inverse quantization value on the first and second inverse quantization value tables are represented by inverse of the inverse quantization values (*referring to tables 1-2*). The advantage of using the teaching of Ishikawa in Tsutsui is to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Tsutsui by incorporating the teaching of Ishikawa in order to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

18. Regarding claims 12-13, and 30-31, Tsutsui further disclose that the expected-value-of-quantization adjustment portion determines the expected value of quantization for the specific sub-band based on the plurality of spectral data contained in the specific sub-band (*col. 7, ln. 31 to col. 8, ln. 21*), and the expected-value-of quantization adjustment portion sets the expected value of quantization for the specific sub-band to a predetermined value (*col. 8, ln. 6-21*).

19. Regarding claims 14-15, Tsutsui does not disclose that the quantization coefficient for the specific sub-band is determined so that an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the quantization

coefficient for the specific sub-band is not smaller than the selected one spectral data and is not greater than the selected one spectral data.

However, Ishikawa teaches that the quantization coefficient for the specific sub-band is determined so that an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the quantization coefficient for the specific sub-band is not smaller than the selected one spectral data and is not greater than the selected one spectral data (*col. 4, ln. 24-67 and tables 1-2, tables are selected based on the input signal*). The advantage of using the teaching of Ishikawa in Tsutsui is to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Tsutsui by incorporating the teaching of Ishikawa in order to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

20. Regarding claim 16, Tsutsui does not disclose that the quantization coefficient for the specific sub-band is selected from first and second quantization coefficients based on a predetermined condition, an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the first quantization coefficient for the specific sub-band is not greater than the selected one spectral data, and an inverse quantization value obtained by inversely quantizing the expected value of quantization for the

specific sub-band using the second quantization coefficient for the specific sub-band is not smaller than the selected one spectral data.

However, Ishikawa further disclose that the quantization coefficient for the specific sub-band is selected from first and second quantization coefficients based on a predetermined condition, an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the first quantization coefficient for the specific sub-band is not greater than the selected one spectral data, and an inverse quantization value obtained by inversely quantizing the expected value of quantization for the specific sub-band using the second quantization coefficient for the specific sub-band is not smaller than the selected one spectral data (*col. 4, ln. 24-67 and tables 1-2, tables are selected based on the input signal*). The advantage of using the teaching of Ishikawa in Tsutsui is to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Tsutsui by incorporating the teaching of Ishikawa in order to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

21. Regarding claims 22-24, Tsutsui further discloses that a resultant value of quantization for each of the plurality of spectral data contained in the specific sub-band is determined (*col. 7, ln. 31-67, describing a process of normalizing and designating quantization precision*) and a method for adjusting the quantization precision so that quantization error is minimize (*col. 11, ln.*

*1-42*). Tsutsui does not disclose that a resultant value of quantization for each of the plurality of spectral data contained in the specific sub-band is determined so that an inverse quantization value obtained by inversely quantizing the resultant value of quantization for each of the plurality of spectral data contained in the specific sub-band, using the quantization cofficient for the specific sub-band, is substantially equal to the each of the plurality of spectral data contained in the specific sub-band; using the quantization cofficient for the specific sub-band, is not smaller than the each of the plurality of spectral data; and using the quantization cofficient for the specific sub-band, is not greater than the each of the plurality of spectral data.

However, Ishikawa further teaches that a resultant value of quantization for each of the plurality of spectral data contained in the specific sub-band is determined so that an inverse quantization value obtained by inversely quantizing the resultant value of quantization for each of the plurality of spectral data contained in the specific sub-band, using the quantization cofficient for the specific sub-band, is substantially equal to the each of the plurality of spectral data contained in the specific sub-band; using the quantization cofficient for the specific sub-band, is not smaller than the each of the plurality of spectral data; and using the quantization cofficient for the specific sub-band, is not greater than the each of the plurality of spectral data (*referring to figures 3-4 or col. 4, ln. 40 to col. 5, ln. 13-67, the inverse quantization value may greater than, equal, or less than the spectral data*). The advantage of using the teaching of Ishikawa in Tsutsui is to enable the system to adjust its quantization precision based on the quantization error calculated by inverse quantizing the quantized signal.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to modify Tsutsui by incorporating the teaching of Ishikawa in order to enable the system to adjust its quantization precision based on the quantization error calculated by inverse quantizing the quantized signal.

22. Regarding claim 25, Tsutsui does not disclose that the resultant value of quantization for a specific spectral data of the plurality of spectral data contained in the specific sub-band is selected from first and second resultant values of quantization based on a predetermined condition, an inverse quantization value obtained by inversely quantizing the first resultant value of quantization using the quantization coefficient for the specific sub-band is not greater than the specific spectral data, and an inverse quantization value obtained by inversely quantizing the second resultant value of quantization using the quantization coefficient for the specific sub-band is not smaller than the specific spectral data.

However, Ishikawa further teaches that the resultant value of quantization for a specific spectral data of the plurality of spectral data contained in the specific sub-band is selected from first and second resultant values of quantization based on a predetermined condition, an inverse quantization value obtained by inversely quantizing the first resultant value of quantization using the quantization coefficient for the specific sub-band is not greater than the specific spectral data, and an inverse quantization value obtained by inversely quantizing the second resultant value of quantization using the quantization coefficient for the specific sub-band is not smaller than the specific spectral data (*referring to figures 3-4 or col. 4, ln. 40 to col. 5, ln. 13-67 and tables 1-2, the inverse quantization value may greater than, equal, or less than the spectral data*). The

advantage of using the teaching of Ishikawa in Tsutsui is to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

Since Tsutsui and Ishikawa are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tsutsui by incorporating the teaching of Ishikawa in order to specify to the quantizer and dequantizer which table to use to process the input data to achieve high efficiency.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Huyen X. Vo

***

June 3, 2004

SUSAN MCFADDEN
PRIMARY EXAMINER